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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Mikael Svedman

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EXAMINER

CALANDRA, ANTHONY J

ART UNIT

PAPER NUMBER

1791

NOTIFICATION DATE

DELIVERY MODE

06/24/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

Office Action Summary	Application No. 10/559,668	Applicant(s) SVEDMAN ET AL.	
	Examiner ANTHONY J. CALANDRA	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3 and 4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3 and 4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Detailed Office Action

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/8/2009 has been entered.
2. Claims 1 and 3 have been amended. Claims 2 and 5-21 have been canceled. Therefore Claims 1, 3 and 4 are currently pending.

Response to Arguments

Examiner notes that the MALKOV reference appeared to be missing from the case file. The examiner has included it for reference.

Double Patenting

In light of claim cancellation the double patenting rejection has been withdrawn.

Art Rejections

Applicant argues KRONELD.

This argument is moot, as due to amendment, KRONELD is no longer necessary.

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Applicant argues that NOREUS increases the chip temperature downstream of bed not just keeping the selected temperature.

The combination of NOREUS with MALKOV remedies the deficiency of NOREUS as disclosed below.

NOREUS teaches heating of woodchips with steam to remove air but teaches that as the chips move along the horizontal bed the temperature increases. This differs from the instant claims in that once the temperature is reached the temperature remains constant. The examiner finds that the person of ordinary skill in the art is a chemical engineer/process engineer with experience in pulping (Graham factor 3).

MALKOV discloses chips can be fully heated to a degasification temperature of 100 degrees within 150 seconds [Figure 23]. MALKOV discloses a second stage of degassing which takes a relatively long time [Figure 25].

At the time of the invention it would have been obvious to apply the new teachings of MALKOV to the apparatus of NOREUS by heating the chips relatively quickly and then holding the temperature for about 60 minutes to remove as much air as possible. The person of ordinary skill in the art would be motivated to apply the teachings of MALKOV because the heat then hold treatment was found to remove over 95% of the air [Figure 25] and the removal of air is an important factor in cooking [pg. 43 paragraph 2].

A majority of the steam will be used in the column of NOREUS as applying treatment of MALKOV requires the heating to be complete in ~150 seconds. The horizontal transfer steam

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use would only comprise make-up steam for heat loss and steam escaping with the air removal and therefore require much less than the steam than the initial heating column. The person of ordinary skill in the art would be motivated to minimize the steam losses in the horizontal transfer section to save money and thus keep total steam under 30%.

Further, it is known by one of ordinary skill in the art that there are four primary mechanisms by which air is removed from chips, internal pressure (expansion of air due to heating) [MALKOV pg. 43 paragraph 3], displacement by evaporated water (as liquid moisture inside the chips evaporates due to heating some air is necessarily pushed out), and through diffusion (through steam or water). The diffusion of air through steam is relatively quick as compared to the diffusion of steam through water. MALKOV further mentions that complete removal of air may be impossible because of surface tension of air-liquid menisci [pg. 49 paragraph 2].

Therefore the person of ordinary skill in the art would be further motivated to perform heating to the degassing temperature take advantage of the diffusion of air through steam. Once the steam condenses and forms a water film on the chips the diffusion will be slower (as compared to through steam), further MALKOV teaches that the water film may even prevent the complete removal of some of the air.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 1, 3, and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent # 4,592,804 NOREUS et al., hereinafter NOREUS in view of U.S. Patent # 5,547,546 PROUGH et al., hereinafter PROUGH, and *Studies on Liquid Penetration into softwood chips – experiments, models and applications* by MALKOV.

As for claims 1 and 3, NOREUS disclose a method for removing gases from lignocellulosic material [abstract], NOREUS discloses a gravimetric column (1) which can be heated from the bottom (6) and (7) and/or around the sides of the column (*heating the comminuted lignocellulose material as a gravitationally lowering column by supplying steam transverse to the movement of the column* [column 4 lines 1-12 and Figure 1]). The material is heated also by steam (2) and (8) where the material advances longitudinal bed (3) (*maintaining the temperature of the composed bed in the horizontal gas removal section at approximately the*

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temperature reached in step b by introducing steam beneath the composed bed [Figure 1 and column 3 lines 50-55]).

NOREUS explicitly discloses that the steaming process is for removing air from the chips by means of steaming [abstract, claim 1]. NOREUS discloses that the steaming removes the air from the chips but does not disclose how the air is removed from the material bed. PROUGH discloses a common chip bin and steaming vessel arrangement in which it shows that vent air can be separated from both the chip bin (25) and the material bed steaming vessel (14) and sent to a condenser and then to an incinerator (*removing gas from above the .gravitationally lowering column, from the gas space above the top of the composed bed, or both* [Figure 1]). At the time of the invention it would have been obvious to a person of ordinary skill in the art remove the air of NOREUS from the material bed in the common and well know method of PROUGH. It is *prima facie* obvious to use a known technique to improve similar device in the same way. In the instant case it would be expected that the material bed of NOREUS would be improved by showing how the air can be removed during steaming.

NOREUS teaches heating of woodchips with steam to remove air but teaches that as the chips move along the horizontal bed the temperature increases and NOREUS does not disclose the treatment temperature (*maintaining the heating so that a temperature of 80°C to 160° is reached in the column; introducing the column of the heated lignocellulose material to a horizontal gas removal section and advancing the heated lignocellulose material as a composed bed through the horizontal gas removal section adjusting the advancing of the composed bed through the gas removal section within a time period allowing the temperature of the composed bed to be maintained at approximately the temperature reached in step b by introducing steam*

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beneath the composed bed at most 30% of the steam supplied to the whole apparatus). This differs from the instant claims in that once the temperature is reached the temperature remains constant. The examiner finds that the person of ordinary skill in the art is a chemical engineer/process engineer with experience in pulping (Graham factor 3).

MALKOV discloses chips can be fully heated to a degasification temperature of 100 degrees within 150 seconds [Figure 23]. MALKOV discloses a second stage of degassing which takes a relatively long time [Figure 25].

At the time of the invention it would have been obvious to apply the new teachings of MALKOV to the apparatus of NOREUS by heating the chips relatively quickly and then holding the temperature for about 60 minutes to remove as much air as possible. The person of ordinary skill in the art would be motivated to apply the teachings of MALKOV because the heat then hold treatment of MALKOV was found to remove over 95% of the air [Figure 25] and the removal of air is an important factor in cooking [pg. 43 paragraph 2]. Further, it is *prima facie* obvious to use a known technique to improve similar devices in the same way. In the instant case it would have been expected that a temperature of 105 degrees C and a time of 60 minutes would remove the air from the chips.

A majority of the steam will be used in the column of NOREUS as applying treatment of MALKOV requires the heating to be complete in ~150 seconds. The horizontal transfer steam use would only comprise make-up steam for heat loss and steam escaping with the air removal and therefore require much less than the steam than the initial heating column. The person of ordinary skill in the art would be motivated to minimize the steam losses in the horizontal transfer section to save money and thus keep total steam under 30%.

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Further, it is known by one of ordinary skill in the art that there are four primary mechanisms by which air is removed from chips, internal pressure (expansion of air due to heating) [MALKOV pg. 43 paragraph 3], displacement by evaporated water (as liquid moisture inside the chips evaporates due to heating some air is necessarily pushed out), and through diffusion (through steam or water). The diffusion of air through steam is relatively quick as compared to the diffusion of steam through water. MALKOV further mentions that complete removal of air may be impossible because of surface tension of air-liquid menisci [pg. 49 paragraph 2].

The person of ordinary skill in the art would be further motivated by to perform quick heating to take advantage of the diffusion of air through steam. Once the steam condenses and forms a water film on the chips the diffusion will be slower (as compared to through steam), further MALKOV teaches that the water film may even prevent the complete removal of some of the air.

As for claim 4, MALKOV discloses that chips can be fully heated to a degasification temperature of 100 degrees within 150 seconds [Figure 23].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. CALANDRA whose telephone number is (571) 270-5124. The examiner can normally be reached on Monday through Thursday, 7:30 AM-5:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. J. C./

Examiner, Art Unit 1791

/Eric Hug/

Primary Examiner, Art Unit 1791